Studies on the Syntheses of the Pyrethrin Analogues and their Biological Activities. (II) : Relationship between the Stereochemistry and the Biological Activities

AUTHOR(S):

Takei, Saburo; Inouye, Yuzo; Ohno, Minoru; Takei, Sankichi

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Relationship between the Stereochemistry and the Biological Activities

Saburo TAKEI, Yuzo INOUYE, Minoru OHNO and Sankichi TAKEI

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The separation of (±)-2,2-dimethyl-3-(3′,4′-methylenedioxyphenyl)-cyclopropane-1-carboxylic acid into the geometrical isomers and the assignment of their configurations were achieved. Of the two isomers, the (±)-*trans*-acid, which was found more toxic when esterified with (±)-allethrolone, was resolved by means of an optically acitve α-phenylethylamine salt into (+)- and (−)-enantiomers. (1*R* : 3*R*)-Configuration was assigned to the (+)-*trans*-acid and (1*S* : 3*S*)-configuration to the (−)-*trans*-acid. The bioassay revealed that the (±)-allethrolone ester with the (+)-*trans*-acid, which belongs to the same optical series as the natural chrysanthemum acids, was the most toxic against common houseflies, as was the case with other pyrethroids.